

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
RELIEF VALVE AND ORIFICE, ITEM 145 ----- SV785860-3 (1)	2/1R	145FM01 External leakage. Body face seal, housing face seal, or adjustment screw O-seal failure.	END ITEM: Suit gas leakage to ambient. GFE INTERFACE: Excessive consumption of the primary oxygen supply. The SOP is automatically activated during EVA if the suit pressure drops to 3.33 psid. MISSION: Terminate EVA. Loss of use of one EMU. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - The item has two face seals (viton) and two radial seals (viton) through which leakage might occur. All groove dimensions and surface finish requirements conform to design standards definitions. Rigid assembly maintains the O-ring sealing function, providing squeeze under all load applications. Operating pressures and temperatures are not extreme. B. Test - Component Acceptance: An external leakage test is performed per AT-E-145-2. The inlet and outlet of the valve are pressurized with nitrogen to 5.55 - 6.55 psid and the valve is submerged in water. No bubbles are allowed from the item for a 5 minute period. PDA: A leakage test is performed during SEMU-60-010 in which the vent loop is pressurized with oxygen to 18.9 - 19.1 psia. Leakage is not to exceed 4.66 scc/min. Certification: Certified for a useful life of 25 years (ref. EMUM1-0106). C. Inspection - O-seal failure is prevented by Inspection of all O-rings for nicks, cuts or voids which could cause a failure. Non-inspected testing of cracking and reseal pressures are done during valve assembly which further verify the integrity of the o-rings. Surface finish and dimensions are 100% inspected. D. Failure History - H-EMU-145-D004 (5-15-81). Cut O-ring and pitted sealing surface caused external leakage - added screening test for pitting and replaced O-ring. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Final SEMU Gas Structural and Leakage. None for EET processing. F. Operational Use - Crew Response Pre EVA: When detected during leak check, trouble-shoot problem, if no success, consider EMU 3 if available. EMU no go for EVA. EVA: When CWS data confirms an accelerated primary O2 use rate, terminate EVA. If CWS data confirm an accelerated primary O2 use rate, coupled with loss of suit pressure regulation, abort EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Flight rules define go/no go criteria related to EMU suit pressure integrity. Consider periodic vacuum O2 recharge to recover EMU operation. EVA checklist procedures verify hardware integrity and systems operational status prior to

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145FM01

EVA. Real Time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-145 RELIEF VALVE AND ORIFICE
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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